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Citation: Partington, Sarah, Partington, Elizabeth, Heather, Nick, Longstaff, Fran, Allsop, Susan, Jankowski, Mark, Wareham, Helen, Stephens, Richard and St Clair Gibson, Alan (2013) The relationship between membership of a university sports group and drinking behaviour among students at English Universities. *Addiction Research & Theory*, 21 (4). pp. 339-347. ISSN 1606-6359

Published by: Informa

URL: <http://dx.doi.org/10.3109/16066359.2012.727508>
<<http://dx.doi.org/10.3109/16066359.2012.727508>>

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ABSTRACT

Aims: The primary aim is to compare members of UK university sport groups with students not engaged in UK university sport in terms of alcohol consumption and risk for alcohol-related harm. A secondary aim is to compare alcohol consumption levels and alcohol-related problems in UK university athletes in different sports and at different competitive levels.

Method: A cross-sectional survey using the *Alcohol Use Disorders Identification Test* (AUDIT) and a demographic questionnaire was carried out with a purposive sample of 770 undergraduates (298 male, 471 female) from seven UK universities.

Results: University sport members ($n = 181$) had a median AUDIT score of 11.5 (interquartile range = 8) compared to students not engaged in university sport ($n = 588$) median AUDIT score of 8 (interquartile range = 11). The difference between medians was highly significant ($p < 0.01$). There was a significant difference between the median scores of members of team ($n = 103$ median = 13, IQR = 8) and individual sports (median = 8, IQR = 11), with team sports members scoring higher on the AUDIT ($p < 0.01$). There were no significant differences on median AUDIT scores between athletes competing at different levels.

Conclusions: Levels of alcohol-related risk and harm are high in members of UK university sport groups. . University sports members particularly team sports may be an 'at risk group' for alcohol-related problems and require targeted interventions. Further research is warranted comparing these student groups , and the relationship between sport type, participation level and alcohol consumption.

KEY WORDS: Alcohol consumption, Sport membership, University students, alcohol related harm, team sports

INTRODUCTION

Although some studies have demonstrated low levels of alcohol consumption among students involved in university sport (Anderson, Albrecht, McKeag, Hough, & McGrew, 1991), others have reported that students involved in university sport drink excessively and drink more than students who do not engage in university sport (Green, Uryasz, Petr, & Bray 2001; Leichliter, Meilman, Presley, & Cashin, 1998; Miller et al., 2003; Nattiv & Puffer, 1991; O'Brien, Blackie, & Hunter, 2005; O'Brien, Hunter, Kypri, & Ali, 2008). Even students competing in organised recreational sport have been found to drink more than those who do not participate in any university-based sport (Ward & Gryczynski, 2007). This has led to the identification of students who are members of university sport groups as a potentially high risk group for alcohol-related harms (Martens, Dams-O'Connor, & Beck, 2006a; Nelson & Wechsler, 2001).

Thombs (2000) proposed that the key to the differences may lie in the drinking patterns exhibited by students in that, while students who are members of university sport groups may not exceed students who do not engage in university sport in terms of *frequency* of drinking, they do exceed them in the *quantity* of alcohol consumed at each drinking session. University athletes have been found to exhibit high levels of heavy episodic drinking (O'Brien et al., 2005 specified seven or more standard drinks within one session), and to engage in heavy episodic drinking at

levels that are higher than those found in students who do not engage in university sport (Doumas, Turrisi & Wright, 2006; Leichter et al., 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman & Zanakos, 1997). In addition, in the USA, the number of university athletes reporting that they drink 10 or more drinks in one sitting significantly increased between 1989 and 2005 (Thompson & Sherman, 2007). Findings such as these have led to those students involved in university sport being identified as a 'high risk' group for heavy episodic drinking (Ford, 2007; Slutske, 2005) and it is perhaps this pattern of drinking that distinguishes them from students who do not engage in university sport.

The suggestions regarding heavy episodic drinking are interesting for UK researchers since findings from Sparkes, Partington, and Brown (2007) identified that heavy episodic drinking may be an integral part of university sport culture in the UK. Drawing any definitive conclusions in relation to UK university drinking patterns in sport groups is problematic as the majority of the research to date on student-based samples has been carried out in the USA, where the drinking culture and legal drinking age are different to the UK. Work carried out in New Zealand by O'Brien et al. (2008) and Martha, Grelot and Peretti-Watel (2009) in France are the closest comparators for the UK in that the legal age for purchasing alcohol in New Zealand and France, as in the UK, is 18 years (Alcohol Advisory Council of New Zealand, 2008, Martha et al. 2009). O'Brien et al. (2008) found that hazardous drinking, including heavy episodic drinking, was high in New Zealand university sports people. In comparison to a matched non-sporting sample, athletes were also found to consume significantly more alcohol. Unfortunately, a specific comparison between groups on heavy episodic drinking was not reported. Martha et al. (2009) found that participating competitively in

a club, institution, federation or at departmental or regional level, particularly in team sports, was related to repeated heavy episodic drinking among male students at the University of Marseilles.

The relationship between involvement in sport and alcohol consumption is complex. Lorente, Souville, Griffet, and Grelot (2004) suggested that the sport-alcohol relationship may depend on a number of sport specific characteristics, such as sport type, context, level of participation and number of training sessions. In support of this suggestion, work by O'Brien and Lyons (2000) indicated that athletes from different sports have different drinking patterns. In addition O'Brien et al. (2005) demonstrated that, amongst a New Zealand sample, the level at which an athlete competes has an impact on their alcohol consumption. Martha et al. (2009) in a French sample found differences dependent upon the context of the sport (formal or informal), the nature of the participation (competitive vs. non-competitive) and the type of sport (team vs. individual).

Given the need to explore potential sports-specific nuances and the lack of research into the drinking behavior of UK university sport group members, there is a need for further investigation into the relationship between alcohol consumption and engagement in UK university sport . The present study forms part of a larger investigation on alcohol-related risk and harm in UK university students. Our general findings can be found elsewhere (Heather et al., 2011). The primary aim of the present study was to compare the alcohol consumption levels and alcohol-related problems of members of UK university sport group members with students not engaged in UK university sport . The secondary

aim of the study was to compare alcohol consumption levels and alcohol-related problems in UK university sport group members competing in different sports (team Vs individual) and at different competitive levels.

METHOD

Full details of the method are given in the previous paper from this project (Heather et al., 2011) and only the main features will be given here. **Heather et al. (2011) provides additional details regarding the use of JACS codes and degree subject classification, the characteristics of the universities included in the final sample, and the measurement tools.**

Ethical approval

Prior to sample selection and data collection, ethical approval for the study was obtained from the ethics committee at each participating university. Following ethical approval the data collection period ran between March 2008 and March 2009, and was confined to term-time.

Sample

Ten universities were purposively selected and invited to take part in the study. Two did not respond, and one agreed but was unable to complete due to delays with the ethics procedure. This meant that seven universities took part in the study. A range of universities was selected

to target a broad undergraduate student demographic in England, with a variety of degree courses, different levels of commitment to university sport, and varied geographical locations both by area within England and in terms of proximity to city centres. A rough indication of commitment to sport was determined by each institution's final position in the preceding year's (2006/2007 season) BUSA (British Universities Sport Association) (now known as BUCS [British Universities and Colleges Sport]) championship table. The BUCS championship table is taken to be an indication of each university's performance in sport and can be viewed as an indirect measure of university commitment to sport performance. Given the aim of exploring the relationship between university sport membership and student drinking, it was deemed important to select universities with a range of levels of commitment to sport, so institutions from the top, middle and bottom of the table were chosen.

At each institution participants were recruited from both science-based and arts-based degree courses using the Joint Academic Coding System (JACS). Courses from the five most popular subject areas (as defined by number of applications) were targeted. Due to the interest in the relationship between university sport membership and student drinking, in institutions where a sport and exercise science course was offered, this was selected as the science-based course. In institutions that did not offer sport and exercise science, an alternative science course was selected.

All courses were three years in length and where possible were the most highly populated courses (based upon student occupancy) in order to recruit the largest sample of participants. Undergraduate students across all three year groups were sampled. A local contact at each institution provided help in gaining ethical clearance and completing data collection.

Participants were given a questionnaire booklet to complete either at the start or end of a lecture. This protocol has been found by previous research (Pickard, Bates, Dorian, Greig & Saint, 2000; Webb, Ashton, Kelly & Kamali, 1996; Webb, Ashton, Kelly & Kamali, 1997) to produce the best response rates.

Testing took place from March to March, covering over a full academic year, when students were members of university sport groups. It was aimed at collecting data based on typical drinking behavior. Key times when drinking would be increased (e.g. “Freshers’ week”) or reduced (e.g. examination periods) were avoided.

Power analysis

The main comparison of interest was between students who were university sport members and those not engaged in university sport, and it was aimed to recruit 300 students in the former category and 500 in the latter. For a comparison between the medians of two independent samples and a two-tailed test with $\alpha = 0.05$, these sample sizes would give 90% power to detect an effect size of $d = 0.2$ (G*Power 3.0.10), conventionally regarded as a small effect size. Two-tailed tests are appropriate because there are reasons to believe that the difference in alcohol consumption medians between the groups could be in either direction.

The sample size obtained was 770 (181 university sport members and 588 not engaged in university sport; missing data on sport engagement = 1). Thus the main comparison between university sports members and those not engaged was less powerful than intended (= 65%

to detect a small effect, $d = 0.2$). Power for comparisons in subsidiary analyses (e.g. team vs. individual sports, competitive levels) was less than for the main comparison.

Measures

In addition to participant information and an informed consent form, the questionnaire booklet included a demographics form. Confidentiality of information was assured and participant codes were created to ensure anonymity. To measure university sport membership participants were asked to state the university sport teams/groups they played for, the highest level they competed at and whether or not they were currently or recently (within the last two months) injured.

Drinking behavior and alcohol-related problems were measured by the Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, de la Fuente & Grant, 1993). The AUDIT is a 10-item screening tool developed by the World Health Organization (WHO) for the detection of alcohol use disorders (Saunders et al., 1993; Babor, Higgins-Biddle, Saunders & Monteiro, 2001), as defined in the International Classification of Diseases and Related Health Problems- Tenth Revision (ICD) (World Health Organization, 1993). The AUDIT has shown a sensitivity and specificity between 80% and 95%, with an area under the ROC curve usually between 0.8 and 0.9 (Reinert & Allen, 2007). In our data Cronbach's alpha for the AUDIT was 0.84, indicating high internal consistency. The AUDIT may also be used to indicate degrees of alcohol-related risk or problem, viz, hazardous drinking (AUDIT = 8-15 inclusive), harmful drinking (AUDIT = 16-19 inclusive) and probable dependence (AUDIT = 20+) (Babor et al., 2001).

Statistical analysis

All questionnaire data were inputted into PASW (V.18). The level of statistical significance was set at 5% for all comparisons. The key dependent variable in the analysis (AUDIT total score) had a bimodal distribution due to a high frequency of zero scores. Because of this non-parametric statistics were used throughout. Measures of central tendency and dispersion for AUDIT scores are reported as medians and interquartile ranges (IQRs) respectively. Effect sizes for differences were calculated using Pearson's Correlation Coefficients r . (Cohen, 1988, p23). Effect sizes are presented only for focused comparisons as these were of most interest. For associations Cramer's V are presented to demonstrate the strength of the relationship between two categorical variables (Acock & Stavig, 1979).

Differences between groups on continuous variables were examined by the Mann-Whitney U-test in the case of two groups or the Kruskal-Wallis analysis of variance by ranks in the case of more than two groups. Relationships between categorical variables were examined by chi-square tests.

RESULTS

Sample characteristics

Table 1 shows demographic and other background characteristics of the sample. In total 770 participants were recruited from seven universities. Compared with UK data from the *Higher Education Statistics Agency* for the academic year 2007-08, the sample was roughly similar in gender (38.8% vs. 42.7% male) and age (56.2% vs. 48.4% 20 years or under) but showed a higher proportion of Black students (12.2% vs. 5.5%).

TABLE 1 ABOUT HERE

AUDIT total scores

There were large and highly significant differences in median AUDIT scores between the seven universities taking part in the survey (Kruskal-Wallis, $\chi^2 = 177.40$, $df = 6$, $p < 0.01$) with a range of medians from 3 (IQR = 9) to 14 (IQR = 9), and a spread of scores between these extremes. Both the highest and the lowest median AUDIT scores came from a new university; medians for the two older universities were close to that for the total sample (= 9, IQR = 11).

Medians and interquartile ranges of AUDIT scores for students who were members of university sport groups, those not engaged in university sport, and the total sample are shown in Table 2 (missing = 11). Members of university sport groups had a median AUDIT score of

11.5 (IQR = 8) compared to a score of 8 (IQR = 11) for those not engaged in university sport. The difference between these medians was highly significant (Mann-Whitney, $Z = 4.89$, $p < 0.01$, $r = 0.18$).

TABLE 2 ABOUT HERE

Further analyses were undertaken to determine the influence of sport type and competitive level on total AUDIT scores. First, sport group members were divided into those predominantly members of team sports (e.g. soccer, rugby, netball) and those mainly predominantly members of individual sports groups (e.g. swimming, racquet sports, martial arts, equestrian sports, table tennis,). Students who were members of team sports ($n = 103$) had a median of 13 (IQR = 8) compared to 10 (IQR = 5) recorded by members of individual sports ($n = 43$). These differences were significant (Mann-Whitney, $Z = 3.01$, $p < 0.01$, $r = 0.25$). Members of team sports also showed a higher median AUDIT score of 13 (IQR = 8) compared to those not engaged in university sport (median = 8, IQR = 11). This difference was also significant (Mann-Whitney, $Z = 5.36$, $p < 0.01$, $r = 0.21$) but the difference between members of individual sports and those not engaged in university sports was not significant (Mann-Whitney, $Z = 0.83$, $p > 0.05$, $r = 0.03$).

Members of university sport groups were further divided into four levels of competition: Intramural, $N = 32$ (22.4%); BUCS, $N = 76$ (53.1%); National, $N = 31$ (21.7%); International, $N = 4$ (2.8%). (Missing data = 39 - these may have been students who played sport at university but not for a university team.) Despite differences in the median AUDIT scores for National = 12 (IQR = 7) and International = 4.5

(IQR = 8), for purposes of analysis, these last two categories were combined into National/International (N = 35, 24.5%) due to the low number of students in each group. Median AUDIT scores for these groups were: Intramural = 12 (IQR = 7); BUCS = 12 (IQR = 8); National/International = 11 (IQR = 9). There were no significant differences between those competing at different competitive levels (Kruskal-Wallis, $\chi^2 = 2.73$, $df = 1$, $p = > 0.05$, $r = 0.23$).

Alcohol use disorders

Table 2 shows proportions of the sample classified by the AUDIT as falling into various categories of alcohol use disorder (missing = 12). It can be calculated from Table 2 that 60.6% of the total sample (79.1% of university sport group members and 54.6% of those not engaged in university sport) were classified as having an alcohol use disorder (scoring 8 or above on the AUDIT). There was a highly significant association between university sport membership and level of risk for alcohol-related harm ($\chi^2 = 35.66$, $df = 3$, $p < 0.01$, Cramer's V = 0.217), with members of university sport groups more likely to be classified as hazardous, harmful and probable dependent drinkers.

Further analyses examining the association between sport type (team versus individual) and the presence of an alcohol use disorder revealed that 84.5% of team members compared to 72.1% of individual sport members were classified as drinking hazardously or worse ($\chi^2 = 9.70$, $df = 3$, $p < 0.05$, Cramer's V = 0.26). When those members of the individual sport group were compared directly to those not engaged in university sport, there was a significant difference in the proportions classified as AUDIT-positive, with a greater percentage of the former than the latter drinking hazardously or worse (72.1% versus 54.6%; $\chi^2 = 12.70$, $df = 3$, $p < 0.01$, Cramer's V = 0.14) (See Table 2).

The association between competitive level and the presence of an alcohol use disorder was not significant (BUCS = 86.8% Intramural = 78.1% National/international = 71.4%, $\chi^2 = 7.91$, $df = 3$, $p = > 0.05$, Cramer's $V = 0.166$).

AUDIT frequency of drinking, quantity of drinking and frequency of heavy episodic drinking

Questions 1-3 on the AUDIT record frequency of drinking, quantity on a typical day and frequency of heavy episodic drinking (6+ units on one occasion, where one UK unit = 8g ethanol). Table 2 shows the number and percentage of university sport group members, those not engaged in university sport,, competitive levels and the total sample responding to each of the drinking categories.

Table 2 shows that members of university sport groups were more frequent drinkers, with over 53.6% drinking at least twice per week compared with 36.4% of those not engaged in university sport. Mann Whitney analysis revealed highly significant differences between university sport group members and those not engaged in university sport in their responses ($Z = 4.52$, $p < 0.01$, $r = 0.15$).

Although typical quantities of alcohol consumed were high amongst those not engaged in university sport, with 18.4% reporting 10+ units per drinking occasion, drinking amongst members of university sport groups was even higher, with 28.2% reporting 10+ units per drinking occasion, and approximately 74.6% reporting that they typically drank more than 5 units per occasion. MannWhitney analysis revealed highly significant differences between university sport group members and those not engaged in university sport ($Z = 5.00$, $p < 0.01$, $r = -0.18$).

Table 2 shows that over half of university sport group members (53.6%) reported that they engaged in heavy episodic drinking (6 or more units of alcohol on one occasion) at least weekly compared with 34.1% of those not engaged in university sport. Mann Whitney analysis revealed highly significant differences in responses between university sport group members and those not engaged in university sport ($Z = 5.18$, $p < 0.01$, $r = 0.19$).

When the influence of sport type on the frequency of drinking, quantity of drinking and frequency of heavy episodic drinking was considered, results revealed no differences between members of team and individual sport groups in the frequency of their drinking ($Z = 1.33$, $p = > 0.05$, $r = 0.11$). However, a significant difference was found in terms of heavy episodic drinking ($Z = 2.56$, $p = < 0.05$, $r = 0.21$) with 58.3% of team sport members engaging in heavy episodic drinking weekly or more frequently compared to 46.5% of members of individual sports. A difference was also found in the amount that team and individual sport members drank ($Z = 2.07$, $p = < 0.05$, $r = 0.17$), with 64.1% of team members drinking 7 or more units when they drank compared to only 46.5% of members of individual sports

There were no significant associations between competitive level and frequency of drinking ($z = 3.91$, $p = > 0.05$) or quantity of drinking ($z = 5.68$, $p = > 0.05$). However, there was an association between competitive level and frequency of heavy episodic drinking ($z = 6.41$, $p = < 0.05$) with 63.1% of BUCS athletes, 56.2% of intra-mural athletes, and 40% of national/international athletes engaging in heavy episodic drinking weekly or more frequently. Post hoc Mann Whitney U-tests revealed that the BUCS athletes engaged in heavy episodic drinking

significantly more than the national/international athletes ($Z = -2.53$, $p = < 0.05$, $r = -0.24$) but not the intramural athletes ($Z = 0.98$, $p = > 0.05$, $r = 0.09$).

DISCUSSION

The primary aim of the study was to provide UK data regarding whether or not members of university sport groups drink more heavily and/or are more at risk for alcohol-related harm than students who are not engaged in university sport. It should be noted that the median score of nine for the total sample is above the conventional cut-point for the designation of hazardous drinking (= eight+) but as shown by AUDIT scores in the present sample, members of university sport groups were found to consume greater quantities of alcohol, to be more at risk for alcohol-related harm, to drink more frequently, to consume greater quantities of alcohol on a typical drinking occasion, and to engage in heavy episodic drinking more regularly than students not engaged in university sport.

These findings broadly replicate those from previous research in the USA and New Zealand showing that university athletes drink more than those students not engaged in university sport (Leichliter et al., 1998; Kueffler, Lira & Choi, 2005; Nattiv & Puffer, 1991, O'Brien et al., 2008). The suggestion by Thombs (2000) that university athletes drink in higher quantities than non-athletes but not more frequently was partially supported by our data. Typical quantities of alcohol consumed were high amongst those not engaged in university sport, with 18% self-reporting 10+ units on a typical drinking occasion. This may be due to the fact that they were in fact participating in sport (formally or informally) outside of the university environment. It is a limitation of the current study that this information was not recorded. Drinking in

members of university sport groups was even higher, however, with over half reporting that they drank more than six units on a typical occasion, and 28% reporting that they drank more than 10 units. However, in direct contrast to Thombs (2000), members of university sport groups were also found to drink more frequently than those not engaged in university sport, with over half drinking at least twice per week compared with only 36.4% of those not engaged in university sport. This may be due to cultural differences in UK and USA university sport. In the USA the majority of data on student athlete drinking relates to elite NCAA division one athletes, and sport is predominantly played in college sport competitions. In the UK university matches are generally played on a Wednesday, and university teams also play in local league competitions at weekends. As a result UK university sport members have the opportunity to participate in one mid-week and one weekend post-match drinking session per week.

In terms of AUDIT risk categories there was a highly significant association between membership of university sport groups and risk of alcohol-related harm, with members of university sport groups more likely to be classified as hazardous, harmful and probably dependent drinkers. The largest proportion of those not engaged in university sport was found to fall into the 'low risk' AUDIT category, whereas approximately only one in five of the university sport group members fell into this category. The remainder of the sample were classified as either harmful drinkers or probably dependent, with greater proportions of university sport group members than students not engaged in university sport falling into these higher categories.

The secondary aim of the study was to compare alcohol consumption levels and alcohol-related problems in students who were members of different sports groups and at different competitive levels. In comparison to members of individual sports, team sport members were found to drink significantly more, to be more at risk for alcohol related harm, to engage in heavy episodic drinking more frequently, and to drink more on a typical drinking occasion. However, no differences were found between team and individual sport members in terms of frequency of drinking. This could be explained by the fact that, although both team and individual sport members attend a similar number of post-match drinking sessions, there may be greater susceptibility to peer influence and peer socialisation in a team environment (Leichliter et al. 1998; Martha et al. 2009).

Those members of individual sports were found to have a higher median score on the AUDIT than those not engaged in university sport but this difference was not statistically significant. A significantly greater proportion of those students who were members of individual sports than those not engaged in university sport exceeded the AUDIT cut-off score (8+). This suggests that the difference in AUDIT scores and hence alcohol-related risk between university sport members and those not engaged in university sport can be explained mainly, but not entirely, by the drinking of those who are members of team sports.

It is difficult to fully contextualize the current findings in respect to previous literature, as few researchers have made a direct comparison of the alcohol consumption of team versus individual sport members and, of those that have, the findings have been contradictory. Some research has demonstrated that team sport members drink significantly more than members of individual sports (O'Brien & Lyons, 2000; Peretti-

Wattel et al., 2003). However, Martens, Watson and Beck (2006b) found that students who were members of university swimming and diving groups (sports considered to be individual in the current study) reported the highest prevalence of alcohol consumption. To further complicate matters, Ford (2007) found that alcohol consumption in men's soccer was low, yet by contrast in women's soccer it was high. Ford (2007) suggests that there may be differences in social networks within the sports that account for these findings. There may also be differences in the cultural attitudes towards substance use that are promoted by specific teams. The findings of the current study indicate that further research is required into the drinking culture of specific sports.

In the present study no significant differences were found on any of the measures in relation to competitive level except for the frequency of heavy episodic drinking. This is in contrast to the findings of O'Brien et al. (2005) in New Zealand who found that elite sportspeople (provincial and international/country level) reported higher rates of hazardous drinking than non-elite sportspeople. Our findings also differ from those of Green et al. (2001), who found that a slightly greater percentage of Division III athletes reported using alcohol at least once in the past year. It could be that there are cultural differences between New Zealand, the USA and the UK in terms of alcohol consumption at the elite level. However, it is also possible that the present study had insufficient statistical power to detect a difference in AUDIT scores between varying levels of sports competition. In particular, there may have been too few athletes involved at national and international levels to form adequate comparisons with other participants.

A difference was found in terms of frequency of heavy episodic drinking, with those involved at BUCS level engaging in heavy episodic drinking more frequently than national/international athletes and also intra-mural athletes. The finding that national/international athletes engaged in the least frequent heavy episodic drinking makes intuitive sense given the fact that they are engaging in high level competition and the associated demanding training schedules. It also argues against the possibility that it is as a result of the pressures of sports competition that athletes use alcohol as a stress coping mechanism (Tricker, Cook & McGuire, 1989). It is likely that BUCS athletes reported the highest levels of drinking as they have more opportunities for socializing and experience more peer pressure to drink (twice weekly post-match drinking sessions) than recreational athletes. This also fits with the suggestion by Sparkes et al. (2007) that high levels of alcohol consumption are an integral part of UK university sports culture.

Limitations of the study include the fact that we were not able to account for students who did not attend the lectures on the days when the questionnaire battery was completed. It is possible that these students had higher levels of alcohol consumption than those who did attend and that their alcohol consumption was related to their non-attendance at lectures (Gill, 2002). Our measure of an institution's commitment to sport was also relatively crude. Although the time-frame was deliberately selected to ensure that more than one academic year was covered, we did not specifically track whether or not sport group members were completing the questionnaire during their on or off season, which could have had an impact on their responses. As mentioned earlier we did not ascertain information regarding whether or not students were involved in sport outside of the university context, nor did we take a measure of intensity and volume of sport participation. A further potential limitation is

that data on alcohol industry sponsorship was not collected. O'Brien, Miller, Kolt, Martens and Webber (2011) found in their study of Australian sports people that receipt of alcohol industry sponsorship was predictive of higher AUDIT scores. Similarly O'Brien and Kypri (2008) showed that receipt of alcohol industry sponsorship and receipt of free and or discounted alcohol products was associated with higher AUDIT scores. Measuring sponsorship as a variable may be helpful in further understanding the differences in alcohol consumption between team and individual sport athletes and potentially between different sports clubs. Finally, in comparison to the sample of students not engaged in university sport, the university sport sample was relatively small and included athletes participating at a variety of different levels.

In summary, our findings indicate that, in our UK sample, members of university sports groups drink more heavily than those who are not engaged in university sport, and are more at risk for alcohol-related harm. In addition, students who are members of team sports consume more alcohol and are more at risk for alcohol-related harm than those who are members of individual sports and most of the difference in alcohol consumption between members of university sport groups and those not engaged in university sport is due to those who are members of team sports. In this study, competitive level did not influence drinking behavior except in relation to frequency of heavy episodic drinking: however, this should be further investigated with a larger sample. Based upon the results of this study we suggest that UK students that are members of university sport groups, particularly team sports, constitute a high risk group for alcohol-related harm and may require targeted interventions. However, given the lack of current UK research comparing members of university sport groups with students not engaged in university sport, and on the relationship between sports specific characteristics and alcohol consumption, and given the limitations of the current study, further

UK research in this area is warranted. In particular further research that looks specifically at the relationship between alcohol consumption and membership of university team sports should be conducted. Key variables to explore include peer influence and socialization, social networks and cultural attitudes towards substance abuse.

ACKNOWLEDGEMENTS

The authors are grateful to all of our colleagues at the participating universities who helped arrange ethical approval and testing. We also thank all of the students who agreed to take part in the study.

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| | Sports (n = 181) | Non-Sports (n = 588) | Total Sample (n = 769*) |
|----------------------|-----------------------------|---------------------------------|------------------------------------|
| Age (Median) | 19 | 20 | 22 |
| Sex | | | |
| Female | 94 (51.9%) | 376 (64.1%) | 470 (61.2%) |
| Male | 87 (48.1%) | 211 (35.9%) | 298 (38.8%) |
| Ethnicity | | | |
| White | 160 (88.4%) | 419 (71.4%) | 580 (75.4%) |
| Black | 7 (3.9%) | 87 (14.8%) | 94 (12.2%) |
| Chinese | 1 (0.5%) | 4 (0.7%) | 5 (0.6%) |
| Mixed | 4 (2.2%) | 22 (3.7%) | 26 (3.4%) |
| Asian | 5 (2.8%) | 44 (7.5%) | 49 (6.4%) |
| Other | 4 (2.2%) | 11 (1.9%) | 15 (2.0%) |
| Accommodation | | | |
| Family | 39 (21.6%) | 236 (40.5%) | 275 (35.9%) |
| On-Campus | 69 (38.1%) | 115 (19.7%) | 184 (24.1%) |
| Off-Campus | 67 (37.0%) | 140 (24.0%) | 208 (27.2%) |
| Other | 6 (3.3%) | 92 (15.8%) | 98 (12.8%) |
| Year of Study | | | |
| First | 91 (50.3%) | 282 (48.1%) | 373 (48.6%) |
| Second | 56 (30.9%) | 200 (34.1%) | 256 (33.3%) |
| Third | 34 (18.8%) | 104 (17.8%) | 139 (18.1%) |
| Degree | | | |
| Sports | 116 (64.1%) | 221 (37.6%) | 337 (43.8%) |
| Non-Sports | 65 (35.9%) | 366 (62.4%) | 432 (56.2%) |

* missing data for sport participation = 1

Table 1. Sample characteristics

| | | | | Sports type | | Competitive level | | |
|--|----------------|--------------|--------------|--------------|--------------|-------------------|--------------|------------------------|
| | Sports | Non-Sports | Total Sample | Team | Individual | Intramural | BUCS | National/International |
| Median AUDIT score (Interquartile range, range) | 11.5 (8, 0-26) | 8 (11, 0-34) | 9 (11, 0-34) | 13 (8, 0-26) | 10 (5, 0-26) | 12 (7, 0-26) | 12 (8, 0-26) | 11 (9, 0-24) |
| Alcohol use disorders | | | | | | | | |
| Low Risk | 37 (20.6%) | 262 (45.3%) | 299 (39.4%) | 16 (15.5%) | 12 (27.9%) | 7 (21.9%) | 10 (13.2%) | 10 (28.6%) |
| Hazardous | 97 (53.9%) | 206 (35.6%) | 303 (40.0%) | 53 (51.5%) | 27 (62.8%) | 19 (59.4%) | 40 (52.6%) | 19 (54.3%) |
| Harmful | 24 (13.3%) | 59 (10.2%) | 83 (10.9%) | 18 (17.5%) | 2 (4.7%) | 3 (9.4%) | 15 (19.7%) | 2 (5.7%) |
| Probable Dependence | 22 (12.2%) | 51 (8.8%) | 73 (9.6%) | 16 (15.5%) | 2 (4.7%) | 3 (9.4%) | 11 (14.5%) | 4 (11.4%) |
| AUDIT Q1 (Frequency of drinking) | | | | | | | | |
| Never | 13 (7.2%) | 79 (13.4%) | 92 (12.0%) | 7 (6.8%) | 4 (9.3%) | 3 (9.4%) | 4 (5.3%) | 4 (11.4%) |
| Monthly or less | 14 (7.7%) | 90 (15.3%) | 104 (13.5%) | 3 (2.9%) | 6 (14.0%) | 3 (9.4%) | 1 (1.3%) | 5 (14.3%) |
| 2-4 times a month | 42 (23.2%) | 168 (28.6%) | 210 (40.5%) | 25 (24.3%) | 6 (14.0%) | 5 (15.6%) | 18 (23.7%) | 7 (20.0%) |
| 2-3 times a week | 97 (53.6%) | 214 (36.4%) | 311 (40.4%) | 56 (54.4%) | 26 (60.5%) | 20 (6.2%) | 44 (57.9%) | 16 (45.7%) |
| 4 or more times a week | 15 (8.3%) | 37 (6.3%) | 52 (6.8%) | 12 (11.7%) | 1 (2.3%) | 1 (3.1%) | 9 (11.8%) | 3 (8.6%) |
| AUDIT Q2 (Quantity of drinking) | | | | | | | | |
| 1 or 2 | 20 (11.0%) | 153 (26.1%) | 173 (22.6%) | 10 (9.7%) | 7 (16.3%) | 3 (9.4%) | 7 (9.2%) | 6 (17.1%) |
| 3 or 4 | 26 (14.4%) | 109 (18.6%) | 135 (17.6%) | 7 (6.8%) | 10 (23.3%) | 2 (6.3%) | 10 (13.2%) | 4 (11.4%) |
| 5 or 6 | 32 (17.7%) | 98 (16.7%) | 130 (16.9%) | 20 (19.4%) | 6 (14.0%) | 6 (18.8%) | 10 (13.2%) | 10 (28.6%) |
| 7 to 9 | 52 (28.7%) | 118 (20.1%) | 170 (22.2%) | 30 (29.1%) | 12 (27.9%) | 8 (25.0%) | 24 (31.6%) | 9 (25.7%) |
| 10 or more | 51 (28.2%) | 108 (18.4%) | 160 (20.7%) | 36 (35.0%) | 8 (18.6%) | 13 (40.6%) | 25 (32.9%) | 6 (17.1%) |
| AUDIT Q3 (Frequency of heavy episodic drinking) | | | | | | | | |
| Never | 20 (11.0%) | 133 (22.7%) | 153 (19.9%) | 7 (6.8%) | 8 (18.6%) | 3 (9.4%) | 5 (6.6%) | 7 (20.0%) |
| Less than monthly | 24 (13.3%) | 127 (21.6%) | 151 (19.7%) | 11 (10.7%) | 7 (16.3%) | 6 (18.8%) | 6 (7.9%) | 5 (14.3%) |
| Monthly | 40 (22.1%) | 127 (21.6%) | 167 (21.7%) | 25 (24.3%) | 8 (18.6%) | 5 (15.9%) | 17 (22.4%) | 9 (25.7%) |
| Weekly | 91 (50.3%) | 186 (31.7%) | 277 (36.1%) | 55 (53.4%) | 20 (46.5%) | 17 (53.1%) | 45 (59.2%) | 13 (37.1%) |
| Daily or almost daily | 6 (3.3%) | 14 (2.4%) | 20 (2.6%) | 5 (4.9%) | 0 (0%) | 1 (3.1%) | 3 (3.9%) | 1 (2.9%) |

Table 2. Median AUDIT scores by sports type and level and for whole sample